

**REMARKS**

Reconsideration of the above-referenced application is respectively requested in view of the above amendments and these remarks. Claims 1-16 are currently pending.

According to the Office Action, claims 1-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,012,161 to Ariyavisitakul et al. Applicant has amended claims 1, 8 and 11. Applicant respectfully traverses the Examiner's rejection.

The present invention is directed to a method and apparatus to cancel interference in a multiple access communication channel. The interference to be cancelled by the present invention comes from other users that are accessing the system simultaneously in a CDMA network. While the present invention is directed to the signal degradation, it is more accurately directed to the degradation of the signal caused by the multiple users in the communications channel. This is shown by the claims that include a first data component that is derived from a first communication channel within the multiple access communication channel and the second data component that is derived from a second channel of the multiple access communication channel. It is not directed to the degradation of the signal caused by the other factors and the errors that are created in the signal by noise or otherwise. In other words, the present invention is not directed to error correction that are created in the signal from the signal being sent from a transmitter to a receiver. Rather, the present invention is directed to "errors" that are inherent in the decoding of the signal.

In particular, the present invention covers the interference caused to a first data component, which is the desired signal of the channel for the communications link, by a second data component, which are the signals from the other channels within the link. As mentioned above, claims 1, 8 and 11 have clarified that the second data component is from a second channel and thus are not derived from other outside noise sources. Interference cancellation is achieved by taking an estimation of the received second data component and then subtracting that component from the total received signal. In one preferred embodiment of the invention, the applied functional approximation is a piece-

wise linear approximation of the hyperbolic tangent function ( $\tanh$ ). In another preferred embodiment of the invention, the applied functional approximation is a piece-wise linear approximation of a probability of error function.

On the other hand, Ariyavisitakul discloses a method and apparatus of equalization of a received signal. Ariyavisitakul discloses a decision feedback equalization (DFE) where the objective is to improve the decoder performance by "undoing" the degradation introduced by the radio channel in the form of the inter-symbol interference (ISI) and fading as well as Doppler. This ISI is different than the interference caused by another channel within the multiple access communication channel. In order to achieve DFE, Ariyavisitakul uses tentative decisions (soft and hard) or partially decoded symbols that are fed back to improve the channel estimation process.

In view of the foregoing, the present invention discloses a method and apparatus to cancel interference in a multiple access channel that uses an estimate of the interference caused by the second data component where the second data component is from the second channel of a multiple access channel. On the other hand, the cited reference discloses a method of equalization that is based on feedback of signals, i.e. "the resulting soft decision on current data value  $x_n$  is then passed back through feedback filter 50, for combination with newly arriving data in data signals 20 but delayed by delay D." Column 6, lines 19-22. The present invention does not rely on any feedback of signals and does not rely on any delays.

In view of the foregoing remarks, Applicants submit that the Ariyavisitakul does not disclose, teach or otherwise suggest the present invention as found in independent claims 1, 8, and 11 and are in condition for allowance. Applicant respectfully requests that the rejection under Section 103(a) be withdrawn. Applicant further submits that dependent claims 2-7, 9-10 and 11-2 are in condition for allowance at least by virtue of their dependency on claims 1, 8, and 11.

As the Applicant has overcome all substantive rejections and objections given by the Examiner and have complied with all requests properly presented by the Examiner, the Applicant contends that this Amendment, with the above

discussion, overcomes the Examiner's objections to and rejections of the pending claims. Therefore, the Applicant respectfully solicits allowance of the application. If the Examiner is of the opinion that any issues regarding the status of the claims remain after this response, the Examiner is invited to contact the undersigned representative to expedite resolution of the matter.

Please charge any fees associated herewith, including extension of time fees, to **50-2117**.

Respectfully submitted,  
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